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19/Response
G. Stanly
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Attorney Docket No. 990204/LH

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): H. OMURA et al

Serial No. : 09/281,710

Filed : March 30, 1999

For : EXTERNAL CAVITY LASER

Art Unit : 2828

Examiner : Cornelius H. Jackson

R E S P O N S E

COMMISSIONER FOR PATENTS
Washington, D.C. 20231

S I R :

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231, on the date noted below.

Attorney: ROBERT P. MICHAL

Dated: May 15, 2002

In the event that this Paper is late filed, and the necessary petition for extension of time is not filed concurrently herewith, please consider this as a Petition for the requisite extension of time, and to the extent not tendered by check attached hereto, authorization to charge the extension fee, or any other fee required in connection with this Paper, to Account No. 06-1378.

This is responsive to the Office Action mailed February 15, 2002, the term for response to which expires on May 15, 2002.

Reconsideration of the present application is respectfully requested.

The February 15, 2002 Office Action and the Examiner's comments have been carefully considered. In response, remarks are set forth below in a sincere effort to place the present application in form for allowance.

PRIOR ART REJECTIONS

In the Office Action claims 1 and 4-10 are rejected under 35 USC 103 as being unpatentable over USP 5,268,910 (Huber '910) in view of USP 5,140,456 (Huber '456).

According to the present claimed invention as defined by claim 1, the external cavity laser includes a FBG (Fiber Bragg Grating) section (20) provided on an optical path between a laser light emitting device (10) and a (first) connector (30), and intercepting means (27) provided on the optical path between the FBG section (20) and the (first) connector (30). This arrangement prevents light which is provided by the laser light emitting device from being returned from the connector through the FBG section toward the external cavity formed between a reflection surface of the laser light emitting device and the FBG section, thereby reducing the relative intensity of noise (RIN).

It is respectfully submitted that the structure recited in claim 1 is not disclosed, taught or suggested by Huber '910 or Huber '456 taken either alone or in combination.

The primary Huber reference (Huber '910) relates to an EDFA (erbium-doped fiber amplifier) which does not at all relate to an external cavity laser of the present invention.

The external cavity laser of the present claimed invention includes a connector provided at an output terminal of an optical fiber, so that it is suitable for use with an apparatus for measuring an optical characteristic of the external cavity laser. More specifically, the external cavity laser of the present claimed invention is designed to reduce influences of return light, coming from an end face of such a connector, upon a laser light emitting device 10 and the like. This makes it possible to

carry out a measurement for accurately determining whether the external cavity laser has required performance, i.e., performance that satisfies requirements determined in accordance with performance specifications of an EDFA-type optical amplifier and the like. The Huber '910 reference fails to disclose, teach or suggest an external cavity laser which makes it easy to perform an optical characteristic measurement as defined by claim 1.

In the Office Action the Examiner contends that a wavelength-division multiplexer 16 of Huber '910 can serve as the connector of the present claimed invention. Applicants respectfully state that this contention is incorrect since the connector of the present invention has a function of transmitting signal light received from an optical fiber to another optical fiber, whereas the multiplexer 16 of the Huber '910 reference, which has a signal light input terminal, a pumping signal input terminal and an output terminal, serves to deliver signal light and pumping light. It is apparent that the multiplexer 16 of the Huber reference is different in construction and function from the connector of the present claimed invention.

Furthermore, in the Huber '910 reference, an ordinary EDFA is connected by means of fusion splicing with an optical fiber for transmitting signal light and an optical fiber for transmitting pumping light. The connections established by fusion splicing entirely differ in construction from the connector of the present claimed invention.

The external cavity laser of the present invention includes intercepting means located on the optical path between the connector and a fiber Bragg grating section that is located between the laser light emitting device and the connector. This indicates that the intercepting means is located on the optical path between the laser light emitting device and the connector.

In this regard, the Huber '910 reference teaches providing an isolator 24 in an optical fiber for transmitting signal light, and the secondary Huber '456 reference (USP 5,140,456) discloses providing isolators 14, 26 in an optical fiber for transmitting signal light. These two references fail, however, to disclose, teach or suggest an isolator provided in an optical fiber between a multiplexer and a pumping light source, and fail to disclose, teach or suggest a pumping light source provided with means for intercepting return light that is reflected from a fusion splice. Thus, the two cited references fail to disclose, teach or suggest the intercepting means of the present claimed invention.

In addition, the Huber '910 reference discloses a fiber grating provided in an optical fiber for transmitting signal light, and the secondary Huber '764 reference discloses in Fig. 5 a fiber grating provided on the side of a pumping light source. However, both references lack countermeasures for reflected return light.

In view of the foregoing, claim 1 is patentable over Huber '910 and Huber '964 taken either singly under 35 USC 102 or in combination under 35 USC 103.

Claims 4-10 which are dependent on claim 1 are patentable over the references of record in view of the dependence on claim 1.

The remaining references of record fail to close the gap between the present claimed invention as defined by claim 1 and the applied references.

Therefore, claims 1 and 4-10 are patentable over the references of record.

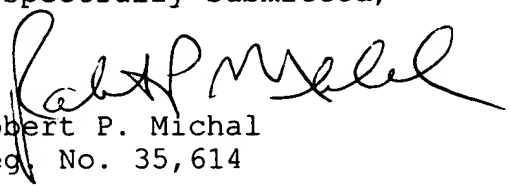
* * * *

If the Examiner disagrees with any of the foregoing, the Examiner is respectfully requested to point out where there is support for a contrary view.

Entry of the amendment, allowance of the claims, and the passing of the application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



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